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10/798,994	03/11/2004	Jeffery Steven Beck	APTI-160US	6851

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EXAMINER	
NGUYEN, LUONG TRUNG	
ART UNIT	PAPER NUMBER
2622	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,994	BECK ET AL.	
	Examiner	Art Unit	
	LUONG T. NGUYEN	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Request for Reconsideration, filed 10/20/2009, with respect to the rejection(s) of claim(s) 1-5, 7-14 under 35 U.S.C. 103(a) as being unpatentable over Borg et al. (US 6,476,864) in view of Hynecek (US 7,218,350) further in view of Kozlowski et al. (US5,892,540) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new non-final office action sets forth below.

Claim Objections

2. Claims 3, 7, 11 are objected to because of the following informalities:

Claim 3 (lines 1-2), claim 7 (lines 1-2), claim 11 (lines 1-2), "a differential amplifier" should be changed to --wherein the differential amplifier--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Henderson (US 7,280,140).

Regarding claim 13, Henderson discloses a method of sampling a group of active pixels comprising:

sampling a voltage on each pixel in a row of pixels to generate a video voltage for each pixel in the row of pixels (figures 1-2, column 2, lines 15-55);

serially sampling each video voltage (signal CDSSIG pulse to sample the pixel output voltage as Vsig, figures 1-2, column 2, lines 15-55);

sampling a unique reference voltage, respectively, for each pixel in the row of pixels as each respective video voltage is sampled (signal REFSMPL pulse to sample the black reference voltage Vblkref as Vblk for each pixel 10, figures 1, 2, column 2, lines 25-55);

receiving, by a differential amplifier (comparator 16, figure 1, column 1, lines 50-60; column 2, lines 15-24) both, the video voltage and the respective unique reference voltage, sampled in series, from each pixel in the row of pixels, and providing, in series, a corresponding differential voltage output.

Regarding claim14, Henderson discloses generating a differential voltage from each sampled video voltage and its associated sampled unique reference voltage (figures 1-2, column 1, lines 50-60); column 2, lines 15-55).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5, 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borg et al. (US 6,476,864) in view of Henderson (US 7,280,140).

Regarding claim 1, Borg et al. discloses an active pixel sensor array sampling system comprising:

a video circuit (column amplifiers 230, figure 3A, column 6, lines 17-60) that generates a video voltage from each pixel in a row of pixels;

a reference circuit (reference column amplifier 240, which generates a unique reference voltage associated with each pixel 10 in each row of active pixel sensor array 280 when the timing controller select which row to read out. It is noted that the reference column amplifier 240 is associated to pixels 10 of active pixel sensor array 280, figure 3A, column 6, lines 17-60) that generates a unique reference voltage associated with each pixel in the row of pixels;

wherein the video circuit comprises a plurality of video amplifiers (column amplifiers 230, figure 3A, column 6, lines 17-60), each video amplifier being associated with a respective pixel in the row of pixels (each amplifier 230 associated with each pixel 10 on each column line 38, figure 3A, column 6, lines 17-60),

the video amplifiers sample in series, one at a time, a video voltage from each pixel in the row of pixels (figure 3A, column 6, lines 17-60),

the reference circuit comprises a single reference amplifier (reference column amplifier 240, figure 3A, column 6, lines 17-60) associated with all of the pixels in the row of pixels,

the reference amplifier samples the unique reference voltage for each pixel in the row of pixels (column 4, lines 15-29).

Borg et al. fails to specifically disclose the reference circuit that generates a respective unique reference voltage, and the reference amplifier separately samples in series, one at a time, the respective unique reference voltage for each pixel in the row of pixels as each pixel in the row of pixels is sampled by a respective one of the plurality of video amplifiers; a differential amplifier receives both, the video voltage and the respective unique reference voltage, sampled in series, from each pixel in the row of pixels, and provides, in series, a corresponding differential voltage output.

However, Henderson discloses an image sensor, in which signal REFSMP and CDSSIG are pulsed simultaneously to sample the black reference voltage Bblkref as Vblk and the pixel output voltage as Vsig for each pixel 10 (figures 1-2, column 2, lines 15-55); Henderson also disclose comparator 16 (differential amplifier) for outputting the difference between sampled values as a reset-related value foe each pixel (differential voltage output), figures 1-2, column 1, lines 50-60; column 2, lines 15-55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Borg et al. by the teaching of Henderson in order to allow a reduction in the size of frame buffer in a double read image sensor system (column 1, lines 29-30).

Regarding claim 2, Borg et al. discloses wherein each of the video amplifiers is associated with all of the pixels in a respective column of pixels (each amplifier 230 associated with each pixel 10 on each column line 38, figure 3A, column 6, lines 17-60).

Regarding claim 3, Henderson disclose a differential amplifier (comparator 16, figure 1, column 1, lines 50-60; column 2, lines 15-24) that generates a differential voltage responsive to the video voltage and the respective unique reference voltage associated with each pixel in the row of pixels.

Regarding claim 4, Borg et al. discloses the reference amplifier has an output continuously coupled to the differential amplifier during reading of the video voltage of each of the video amplifiers (figures 3A, 4, column 6, lines 17-60).

Regarding claim 5, Borg et al. discloses an active pixel sensor array sampling circuit that samples a voltage on each one of a plurality of pixels, the circuit comprising:

a plurality of video circuits (column amplifiers 230, figure 3A, column 6, lines 17-60), each video circuit generating a video voltage related to a voltage on a respective one of the pixels as its respective pixel is sampled;

a reference circuit (reference column amplifier 240, figure 3A, column 4, lines 15-29, column 6, lines 17-60) that separately samples a unique reference voltage as each pixel in the plurality of pixels is sampled by the video circuits;

wherein the pixels are arranged in columns and rows, wherein the reference circuit is associated with all of the pixels of each row of pixels, and the reference circuit samples a unique reference voltage as each video voltage of each pixel in a row of pixels is sampled (figure 3A, column 4, lines 15-29, column 6, lines 17-60).

Borg et al. fails to specifically disclose the reference circuit that samples a respective unique reference voltage, and the reference circuit samples the respective unique reference voltage as each video voltage of each pixel in a row of pixels is sampled; a differential amplifier receives both, the video voltage and the respective unique reference voltage, sampled in series, from each pixel in the row of pixels, and provides, in series, a corresponding differential voltage output.

However, Henderson discloses an image sensor, in which signal REFSMP and CDSSIG are pulsed simultaneously to sample the black reference voltage Bblkref as Vblk and the pixel output voltage as Vsig for each pixel 10 (figures 1-2, column 2, lines 15-55); Henderson also disclose comparator 16 (differential amplifier) for outputting the difference between sampled values as a reset-related value foe each pixel (differential voltage output), figures 1-2, column 1, lines 50-60; column 2, lines 15-55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Borg et al. by the teaching of Henderson in order to allow a reduction in the size of frame buffer in a double read image sensor system (column 1, lines 29-30).

Regarding claim 7, Henderson disclose a differential amplifier (comparator 16, figure 1, column 1, lines 50-60; column 2, lines 15-24) that provides a differential voltage representing a difference between each sampled video voltage and each sampled respective unique reference voltage.

Regarding claim 8, Borg et al. discloses wherein the reference amplifier has an output continuously coupled to the differential amplifier during the sampling of the video voltages for each row of pixels (figures 3A, 4, column 6, lines 17-60).

Regarding claim 9, Borg et al. discloses wherein each video amplifier is associated with all of the pixels of a respective column of pixels (each amplifier 230 associated with each pixel 10 on each column line 38, figure 3A, column 6, lines 17-60).

Regarding claim 10, Borg et al. discloses an integrated circuit including an active pixel sensor array sampling system comprising:

a plurality of video circuits, each video circuit sampling a video voltage from a respective pixel in a row of pixels (column amplifiers 230, figure 3A, column 4, lines 15-29, column 6, lines 17-60);

a reference circuit (reference column amplifier 240, figure 3A, column 4, lines 15-29, column 6, lines 17-60) that separately samples a unique reference voltage for each pixel in a row of pixels, as each video voltage is sampled by a respective one of the video circuits.

Borg et al. fails to specifically disclose a reference circuit that samples a respective unique reference voltage for each pixel in a row of pixels, as each video voltage is sampled by a respective one of the video circuits; a differential amplifier receives both, the video voltage and the respective unique reference voltage, sampled in series, from each pixel in the row of pixels, and provides, in series, a corresponding differential voltage output.

However, Henderson discloses an image sensor, in which signal REFSMP and CDSSIG are pulsed simultaneously to sample the black reference voltage Bblkref as Vblk and the pixel output voltage as Vsig for each pixel 10 (figures 1-2, column 2, lines 15-55); Henderson also disclose comparator 16 (differential amplifier) for outputting the difference between sampled values as a reset-related value foe each pixel (differential voltage output), figures 1-2, column 1, lines 50-60; column 2, lines 15-55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Borg et al. by the teaching of Henderson in order to allow a reduction in the size of frame buffer in a double read image sensor system (column 1, lines 29-30).

Regarding claim 11, Borg et al. discloses a differential amplifier (comparator 16, figure 1, column 1, lines 50-60; column 2, lines 15-24) that generates a differential voltage responsive to each read video voltage and its respective sampled unique reference voltage.

Regarding claim 12, Borg et al. discloses wherein the pixels are arranged in columns and

rows and wherein each video circuit is associated with all of the pixels of a respective column of pixels (figure 3A).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/
Primary Examiner, Art Unit 2622
01/03/10